

**ENZYMES HAVING POLYMERASE ACTIVITY AND METHODS OF USE
THEREOF**

ABSTRACT

The invention relates to thermostable polymerases that have polymerase activity temperatures in the range from 90° C up to 113° C, such as those derived from *Pyrolobus fumaria*, and to polynucleotides encoding the polymerases. In addition, methods of designing new thermostable DNA polymerases and methods of use thereof are also provided. The 5 polymerases have increased activity and stability at increased pH and temperature.